

written history fails to afford information, and who are only known through archaeology. The adoption of the word by Sir John Lubbock in the title of his "Prehistoric Times," published in 1865, and its incorporation into the name of the "Congress of Prehistoric Archaeology," which held its first meeting at Neuchâtel in 1866, brought it into general currency.

The present third edition of Dr. Wilson's "Prehistoric Man" contains the principal dissertations of the original work. These are especially the account of the earth-works of the mound-builders of Western America, of the native-copper mines worked by the indigenes in the Lake Superior district, the details of stone and shell implements in America, and studies of American craniology. The book has been now expanded so as to bring the new European evidence into connection with the American investigations, and in the course of correcting, various rash statements made in the previous editions have been pruned away. It is of course not necessary to go over the contents as though the work were new, but the following are among the points calling for remark:—

Living at Toronto as Professor of History at the local University, and having had special opportunities of studying the indigenes of North America and their antiquities, Dr. Wilson sees the problems of general ethnology from a peculiar point of view, which is often an advantageous one. For instance, as an archaeologist living within reach of the above-mentioned native copper workings of Lake Superior, he was naturally led to give due attention to the interesting intermediate stage here represented between the Stone Age proper and the Metal Age proper. The tribes of the district had got so far as to discover that the copper they found in blocks was a malleable stone of great value for making hatchets and other tools of, but they had not arrived at the next stages, those of learning to smelt copper from the ore, and to alloy it with tin. Such an intermediate stage may possibly have at some time existed also in the Old World (vol. i., p. 230). Dr. Wilson's remarks are interesting both on the use of native copper among the northern tribes of the continent, and on the manufacture of bronze in Mexico and Peru. But the author's American surroundings perhaps incline him to ascribe too readily to the native tribes an absolute independence in the development of their civilisation, uninfluenced during historic centuries (as he says) by any reflex of the civilisation of the Ancient World. We do not think that he ought to have assumed (vol. i. p. 224) that the art of bronze-making was developed in the native-born civilisation of Mexico and Peru. He seems to recognise (vol. ii. p. 60) Humboldt's argument, that the Mexican astronomical calendar came from Asia, and if so, why should not the art of bronze-making have come thence too, and at no very ancient date? Dr. Wilson himself points out the likeness between the mirrors of polished bronze found in the royal tombs of Peru and those now in use in Japan (vol. i. p. 244).

There are two assertions often made as to the inhabitants of the part of America with which Dr. Wilson is well acquainted. One is that the skull and face of the English race in the United States are becoming assimilated to the type of the North American Indians. On this Dr. Wilson's remark is simply negative: "I can scarcely imagine anyone who has had abundant oppor-

tunities of familiarising himself with the features of the Indian and the New Englander, tracing any approximation in the one to the other" (vol. ii. p. 329). The other assertion touches the intellectual powers of the Negro as compared with the white race. For instance, Sir Charles Lyell was told in Boston (as many other Englishmen have been) as a reason for the coloured children being taught separately from the whites, that although up to the age of fourteen the Negro children advanced in education as fast as the white children, after that point it became difficult to carry them on further. Dr. Wilson regards this statement as a mere excuse, intended to justify a separation really made through caste-prejudices (vol. ii. p. 325). Dr. Wilson's testimony is of consequence on these two points, which rest on so considerable authority, that they ought without delay to be settled one way or the other. We can only hope he will find time to go more fully into them, considering their importance as throwing light on climatic modification of race on the one hand, and intellectual difference between races on the other.

Dr. Wilson is evidently more critical as an ethnologist and antiquary than as a comparative philologist. It is a pity that among the new matter inserted in this edition, he should have put in a passage which may lead uninstructed readers to believe that a connection has been really made out between the Guarani of Brazil and the Agaw of the Nile region, or between the Akkadian or Babylonia and any American language (vol. ii. p. 346). Dr. Wilson mentions certain theories propounded by Mr. Hyde Clarke, but he does not even produce the evidence on which he relies. On the contrary, it may be said with some confidence, that as yet no philologist has proved any prehistoric connection whatever between any language of America and any language of the Old World, except of course, near the shores of Behring's Straits.

In fairness to Dr. Wilson, however, the value of other of his linguistic contributions must be acknowledged; for instance, his list of imitative names of animals in Algonquin dialects, and his remarks on the Chinook jargon, and the *Pigeon-English* (i.e. *Business-English*) of the Chinese ports. The specimen of the latter (vol. ii. p. 333) is the introduction of a new English customer to a Chinese merchant:—"Mi chinchin you, this one velly good flin belong mi; mi wantchie you do plopel pigeon along he all same fashion along mi," &c. On the whole Dr. Wilson is to be congratulated on the reappearance and revision of his work.

EDWARD B. TYLOR

THE ARALO-CASPIAN REGION

The Shores of Lake Aral. By Herbert Wood, Major R.E., F.R.G.S., &c. (London: Smith, Elder and Co., 1876.)

FROM the earliest times down to the present day there has always been a certain amount of mystery and uncertainty hanging around the Aralo-Caspian region. Major Wood in the work before us shows that the physical history of this ever-changing region is largely sufficient to account for this mysterious halo. Major Wood had an unusual opportunity for exploring Lake

Aral and the regions around it in 1874, having been allowed to accompany an expedition sent out under the auspices of the Russian Geographical Society to examine the Amúdarya. The results of this visit, as contained in the masterly work under notice, show that he took excellent advantage of so favourable an opportunity. Some of the most important of these results as regards the past and present physical condition of the Aralo-Caspian region were described by Major Wood in three papers which appeared in *NATURE*, vol. xi. p. 229, and vol. xii. pp. 51 and 313. To these papers we would refer those who want to get a succinct idea of some of the important conclusions which Major Wood has reached; but all who take an interest in physical geography generally, and this region in particular, we would advise to procure the work under notice.

The two main points discussed by Major Wood are the past and present condition of the Amúdarya or Oxus, and the existence at one time of a great Asiatic fresh-water Mediterranean Sea, of which the Black Sea, the Caspian, and Lake Aral are only remnants, and having communication by the region to the north of the last-mentioned lake with the Arctic Ocean. How small a change in the present conditions of the Black Sea would serve to give rise to such a great inland sea as Major Wood, on good grounds, supposes once to have spread its waters over a wide extent of Asia and Europe, may be seen from the following extract:—

"Supposing the outlet of the Bosphorus to be closed to the height of two hundred and twenty feet above sea-level, the superfluous waters of the Black Sea basin, which now flow off to the Mediterranean, would rise in level and encroach on the south Russian steppes and the lower Danube plains, though the coasts of Asia Minor, which form the southern boundary, would be but little changed on account of their steepness. On attaining a height of about twenty-three feet above sea-level¹ the waters would escape by the line of the Manytsch into the basin of the Caspian, and, after having filled it up also, would flood the country intervening between it and Lake Aral. In their ascent to this basin the waters would chiefly pass by the Emba steppes from the north-east of the Caspian basin, and from Balkhán Bay on the south-east, up the country crossed by the Uzboy channel of the old Oxus; for between the two seas lies the elevated plateau of Ust-Urt. This high ground has several detached portions near the Caspian shore, while the remainder of its surface is covered with numerous bowl-shaped depressions. These would, in all probability, have received the rising waters by ravines which enter the body of Ust-Urt from the low steppes upon its north and upon its south, and the aspect of the plateau would thus have been changed into that of the lake and marsh sprinkled highland whose traces remain to-day.

"In this imaginary reconstruction of the Asiatic Mediterranean, the moment the rising waters reached a point at about two hundred and ten feet above the sea, and which is situated at the head of the now dry gulf Abougir, they would have entered into and filled up the basin of Lake Aral."

Many indications exist at the present day pointing to the great probability of the existence, at some perhaps not very remote period, of such an inland sea. The

¹ This is the height of the surface of the lake, which exists in the bed of the Western Manytsch, at its higher extremity, though the level of the banks, at the bifurcation of the Eastern and Western Manytsch channels, is more. M. Hommaire de Hell stated this height to be nearly ninety feet above the sea, which is not very incorrect, though perhaps slightly in excess of reality.

fauna of the basins of the Black, the Caspian, and the Aral Seas are nearly identical; a glance at the fine map which accompanies the volume shows that the region to the north of the Aral is covered with lakelets, and evidence exists that in historical times the Aral was joined to the north part of the Caspian. The amount of evidence, historical and physical, produced by Major Wood in support of the ideas developed in his work, is very great, and we think in the main convincing.

The author devotes a number of chapters to the Amúdarya, the lower course of which he has explored with the greatest minuteness; indeed he seems familiar with every mile of it. He gives a clear and detailed account of the lower arms of the Amú—which are not at all of the nature of a delta—by which it discharges itself into Lake Aral. No dependence can be placed on the permanence of these outlets, nor indeed it would seem upon that of any part of the Amú for the last 400 miles of its course. It is known that at one time it flowed into the Caspian, and Major Wood's work and map show how this could easily have been, and could easily be again brought about at the present day. From Tchardjui an old bed is seen to strike westwards to the Balkhan Bay of the Caspian, and from this branch again Major Wood adduces evidence to prove that, periodically at least, another must have struck south-westwards into the Attrek, which has been so much in the front recently. The Amú, indeed, throughout historical and no doubt prehistorical times, has been an ever-changing river, in its lower course at any rate; its frequent and perplexing changes being caused partly by the physical conditions which regulate its flow, and partly by the interference of man; for at the present as in past times the river is tapped at several places for the purpose of irrigating the desert regions which lie to the west. The river divides at Khodjeili into three main branches, which carry its water to Lake Aral; but these seem to be ever shifting, and the region embraced between them, inhabited by the poor Karakalpakhs, seems to be mostly a swamp.

Major Wood also devotes some space to an account of the Syrdarya or Jaxartes, which at one time discharged a considerable proportion of its waters by the Jany Darya into the Amú, and thus probably ultimately into the Caspian. Major Wood traversed the district between the lower Amú and Fort Perofsky, the Kizzel Koom desert, and came across distinct traces of a former channel. But altogether the amount of evidence, historical and physical, which he brings forward to show the changes which have taken place in the region under consideration is almost bewildering. Greek, Arabic, Russian, and Chinese writers of all ages are quoted; indeed Major Wood seems to have collected every important scrap of writing that bears on the region he is investigating. This historical evidence, combined with the physical conditions of the region with which he has made himself thoroughly familiar, enable him to make out a strong case on behalf of all the points he desires to establish. The work must always be regarded as a standard reference-book on the hydrography of the Aralo-Caspian region. But it is something more; notwithstanding that it endeavours to solve some very hard questions, it is never dry, never uninteresting. It contains a record of a pleasant and profitable journey from Samara on the Volga to the Russian ports on the Syr, a

cruise down the Sea of Aral, and up the Amú, and, as we have said, a journey across the dreary desert of Kizzel Koom. Major Wood conveys, we think, a clearer and more vivid idea of the region indicated, its aspects, and its inhabitants, their characteristics and habits, than any other author we know. The maps which accompany the volume are a great assistance. We may note that they give the present level of the Caspian as 85 feet below that of the ocean, Lake Aral being 158 feet above sea-level. This, we presume, may be taken as authoritative for the present, and it ought to be noted, as the statements on the point in various authorities differ in a most remarkable way.

Major Wood naturally speaks of the conduct of Russia in Asia with warm approval, and indicates several beneficial results which have followed her recent conquests. He believes that of all European powers she, partly from the simplicity of her Government, and partly on account of her ethnic affinities, is best suited to wean the wandering hordes of Central Asia to a settled and civilised life. We strongly recommend Major Wood's work as one of substantial value and great interest. But why has a work of such importance and so full of details, been allowed to go forth without an index. We hope this omission will be remedied at the first opportunity.

OUR BOOK SHELF

La Théorie des Plantes Carnivores et Irritables. Par Edouard Morren. (Bruxelles: F. Hayez, 1876.)

In this pamphlet, a report of an address given at the annual public meeting of the scientific section of the Royal Academy of Belgium, on Dec. 16, 1875, Prof. Morren gives an admirable *résumé* of the present state of our knowledge on these two branches of vegetable physiology. As regards the now well-known phenomena of carnivorous plants, he gives the most essential points of the observations of Darwin, Hooker, Lawson Tait, Reess and Will, the author himself, and others: and, in contrast to his relative, M. Charles Morren, he gives his full adhesion to the view that nitrogenous substances are actually digested by the leaves of *Drosera*, *Pinguicula*, and *Nepenthes*. He points out, indeed, that the theory is not a new one, having been promulgated by Burnett in 1829, as respects *Sarracenia*; and by Curtis in 1834, and Canby in 1868, as to *Dionæa*; and also, he might have added, by Dr. Lindley, in his "Ladies' Botany," published in 1834. In his introductory remarks Prof. Morren insists on the identity of the process of nutrition in the animal and vegetable kingdoms. The second portion of the discourse is devoted to the elucidation of the phenomena of "Motility" as exhibited in the irritability of the leaves of *Mimosa*, the stamens of *Berberis*, and other organs which exhibit similar peculiarities; the aggregation of protoplasm as seen in the "tentacles" of *Drosera*; the apparently spontaneous movements of zoospores, climbing plants, &c. Anyone desiring to obtain a general idea of what is at present known on these interesting subjects could not do better than consult Prof. Morren's lecture. It is pleasant to find a tribute to "la science Anglaise" in connection with vegetable physiology.

A. W. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

Supposed New Laurentian Fossil

WHEN a man finds that he has made a mistake, the best thing he can do is frankly to acknowledge and explicitly to correct it.

I lose no time, therefore, in making known to the readers of NATURE that the notice of a New Laurentian Fossil which I published in its columns three weeks since, was written under a complete misapprehension of the real nature of the body. So far from being calcareous, as I had been led to believe by the information I had received from the geologist who found the specimen, it proves to consist of alternating layers of felspar and quartz—the former simulating an organic structure like that of *Stromatopora*, and the latter occupying what had been supposed to be the cavities of that structure—together constituting what is known to petrologists as "graphic granite."

The conclusions I had drawn from a cursory examination of the sections first sent me by Mr. Thomson, instead of being confirmed by a more minute study of thinner sections, proved to be altogether untenable; what I had supposed to be piles of flattened chamberlets in the thickness of each lamella, turning out to be mere fissures in the felspar, arranged with extraordinary regularity; and what had seemed to be a vertical tubular structure, proving to be mere striation.

The examination of numerous sections of this body, and a comparison of them with sections of the "graphic granite" found in its neighbourhood, has now satisfied me that the former presents no other indication of organic origin, than is afforded by the *Stromatopora*-like disposition of its alternating lamellæ; and that this is so nearly approached in the latter, as to show that the agencies which produced the "graphic granite" were competent to have produced the supposed Harris fossil.

Whether these agencies were entirely inorganic, or whether the "graphic granite" itself may not be a metamorphic form of an ancient organic structure (metamorphoses nearly as strange having undoubtedly happened), is a question which is not at present to be decided by anyone's *ipse dixit*. When a petrologist shall have succeeded in making a graphic granite, he will be entitled to speak with assurance of its purely mineral nature.

It will doubtless be triumphantly urged by those who maintain *Eozoon* to be a "pseudomorph," that as I have had to confess myself completely mistaken in regard to the Harris specimen, I am just as likely to have been wrong in regard to the Canadian opicalcite. To this I have simply to reply that my mistake in the present case has arisen entirely from undue haste, and has been corrected by my own more careful study; which has satisfied me of the *entire absence*, in the Harris specimen, of those Foraminiferal characters which seem to me unmistakably recognisable in the Canadian *Eozoon*.

In the memorable discussion at which I was present in Paris, on the flint implements found associated with the Abbeville jaw, it was the *entire absence*, on the surface of those worked flints, of the staining, the dendrites, the patina, and the wearing of the edges, characteristic of the genuine implements, which satisfied the English experts of the factitious character of the former. But, so far from anyone being led by this discussion to call in question the fashioning of the genuine implements by men coeval with the river-gravels of the Somme, it only brought out more fully the strength of that case, by showing what complete reliance might be placed upon the characters of antiquity which they presented. And so, in the present instance, the striking contrast in the microscopic appearances presented by two bodies bearing a close resemblance in general structure, seems to me only to bring out the organic characters of the one more decidedly, by comparison with the purely mineral characters of the other.

WILLIAM B. CARPENTER

Theory of Electrical Induction

I WAS hoping someone of eminence would tell us what he thought of the arguments of Prof. Volpicelli, or whether no clearer view of induction had been arrived at. Prof. Clerk Maxwell's letter of last week brings back the subject to its natural point of view to one whose ideas are based upon potential, but at the same time it leaves some points doubtful which have a particular bearing on the whole theory. Might I therefore be allowed to ask information from him, by explaining the ideas which have been impressed upon me about this, by reading his book "Electricity and Magnetism," though they are removed *toto celo* from the ideas expressed by the phraseology of Prof. Volpicelli, and that of the usual text-books.

We know nothing of electricity except as a force. We may speak of it as a fluid, and use a corresponding terminology, but it is always measured as force. A conductor is a body in which